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ABSTRACT

Presented is a Learning Activity Package (LAP) study concerned with the study of biological reproduction. The LAP begins with the rationale for studying the reproductive process and is then divided into two sections. Contained within each section are student objectives (stated in behavioral terms), a list of resources (readings and problems, visuals), related laboratory activities, and a student self-evaluation. (PEB)

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RATIONALE

The process of reproduction provides for continuity which, without, no life would remain on earth. In this LAP, we will deal with the variety of ways that have evolved to propagate life. We shall learn how the genetic "blue prints" of life are passed from one generation to the next. The study of reproduction will lead us to our search of how this genetic material can account for the great variation amoung living forms.

Reproduction and Development 103

I. Patterns of Reproduction

asexual	sexual
mitosis	meiosis

Reproduction in Plants
Reproduction in Animals

menstral

II. Development

plants
animals
theories of development

Section I Patterns of Reproduction

BEHAVIORAL OBJECTIVES:

After completing the resources and activities, you will be able to complete the following on a written or oral test within one class period.

1. You will be able to describe at least three types of asexual reproduction. (2-a)

2. You will be able to define the following terms: gamete, zygote, ova, sperm. (2-b)

3. You will be able to draw. label and describe the processes which occur during a complete cycle of mitosis.

4. You will be able to define the following terms:

(a) homozygous	(c) haploid
(b) heterozygous	(d) diploid

5. You will be able to draw, label and describe the process of meiosis giving attention to the actions of the chromosomes. (2-b)

6. You will be able to dontrast sexual and asexual reproduction in terms of basic differences between them. (1a-13-4)

LII You will demonstrate your understanding of the evolution of sexual reproduction by comparing the reproductive patterns of the following plants: (1-a) (2-c)

(a) ulothrix
(b) moss
(c) flowering plants

7. You will be able to identify and describe the function of the following structures of an angiosperm flower. (1-a) (3-a)

(a) anther
(b) stigma
(c) ovary
(d) petal
(e) sepal
(f) ovules
(g) stamen
(h) style

8. You will be able to describe the mutucelisdic behavior of the Yucca and Pronuba with respect to specific examples of insect pollenation. (1-b)

9. You will be able to describe the basic difference between plant and animal sexual reproduction with respect to gamete formation. (1-b)

10. You will show your understanding of sexual reproduction by describing the adaptive advantages of internernal fertilization as compared to external fertilization. (1-c)

Resources

Readings and Problems-

1. Biological Science - Molecules to Man
   (a) pp. 299-306 (b) pp. 307-311 (c) 313-316
2. High School Biology 2n Ed.
   (a) pp. 578-582 (b) pp. 584-591 (c) pp. 591-599
   (d) pp. 394-397
3. Biology Silver Burdett (a) 504-506 (b) 526-531
4. Biology Introduction to Life pp. 500-504

Visuals-

20. Maturation of Gametes f-s

Laboratory-

1. "Sexual Reproduction of Flowering Plants"
   B.S.C.S. Blue version pp. 306-307
2. "Sexual Reproduction in Animals" Blue version pp. 311-313

SELF EVALUATION SECTION I

1. Describe the process of meiosis.

2. What are the two basic processes of sexual reproduction?

3. Compare the advantages of internal and external fertilization.

Section II Development

11. You will be able to describe how the processes of cell division, growth and differention contribute to the development of an individual.

12. From a given monocot or dicot seed or drawing of the seed, you will be able to identify the following structures and give their functions.
    (a) cotyledon (b) embryonic root (c) embryonic shoot

13. You will be able to identify the three major regions of meristem tissue and describe the structure which these regions produce.

LII You will demonstrate your understanding of the development of theories of growth by comparing the theories of epigensis and preformation which those of the present. (1-b)

14. You will be able to compare egg cleavage in the frog to that of a chicken in respect to formation of cleavage lines. (1-c)

15. You will be able to explain the formation of the blastula and gastrula stages of development in terms of the cellular growth. (1-c)(2a)

16. From a given list of organs, you will be able to identify the germ layer (endoderm, ectoderm, or mesoderm) which gave rise to this organ. (1-c) (3-a) (organ listed on p. 375 of Blue)

LII You will demonstrate your understanding of the theories of Wilheml Roux, Hans Driesch and Hans Spemann by describing the conclusions reached by continuing the theories of each. (1-d)

LII You will complete laboratory 14-16 "Investigating Regeneration in Planarians" and include conclusions reached in your lab write up. (page 365 Blue version)

17. You will be able to give at least three examples in which regeneration differs in various organisms. (3-e)

18. You will be able to contrast cancerous growth to that of normal growth. (3-f)

Resources

1. Biological Science "Molecules to Man" 2n ed.

   (a) 341-348 (b) 348 (c) 350-358 (d) 358-362 (e) 366-368 (f) 368-369

2. Biology Silver Burdett (a) 526-532

3. Biology -Introduction to Life (a) 517-519

Visuals-

20. 2 x 2 slider & tape - development of vertebrates

Activities -
1. Answer and turn in questions on page 358 of Blue Version.
2. Answer and turn in questions 6,7,8,14.

Laboratories-
1. Investigations the Development of Chick Embryo" B.S.C.S. Blue page 349 (14-6)

SELF EVALUATION SECTION II

1. List the germ layer which gives rise to each of the following tissue.

   (a) nerve

   (b) bone

   (c) skin

   (d) muscle

2. What is the function of the cotyledon?

3. List two regions of meristem tissue in plants.

4. Compare the blastula stage of development to that of the gastrula stage.

5. Describe how regeneration in a crayfish differs from that in man.